PATENT ABSTRACTS OF JAPAN

(11)Publication number : 09-059898
(43)Date of publication of application : 04.03.1997

(51)Int.Cl. D21H 19/44
D06M 10/00

(21)Application number : 07-207034
(22)Date of filing : 14.08.1995

(71)Applicant : MITSUBISHI PAPER MILLS LTD
(72)Inventor : NODA TORU
MATSUDA NORIYUKI

(54) RESIN-COATED PRINTING PAPER

(57)Abstract:
PROBLEM TO BE SOLVED: To obtain resin-coated printing paper excellent in offset pintability and print maneuverability after printing by activation treatment of the surface of a resin layer provided on one face of base paper, and laminating the surface with a coating layer containing a specific copolymer emulsion.
SOLUTION: The objective resin-coated printing paper having a contact angle of ≥60° at one second after purified water of 3.0μl is dropped on to the coated face of the paper at 25°C and 65% of relative humidity is obtained by coating a surface of base paper composed mainly of natural pulp with a resin layer A which contains polyethylene-, polypropylene-, polyester- or polycarbonate-based resin as a main component, and such a pigment as Ti dioxide or calcium carbonate, forming a resin layer B composed of the above resin and pigment on the other face of the paper, then activating the resin layer A by corona discharge, and providing the activated resin layer A with a coating layer comprising an emulsion of a copolymer which is composed of structural units of ethylene within the range of 80-98.5mol%, acrylate within the range of 0.5-10mol% and cationic acrylamide within the range of 1-10mol%, and has weight-average molecular weight of 1,000-50,000.

LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

* NOTICES *

1. This document has been translated by computer.So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]
[Claim 1] In the resin covering paper for printing by which the paper substrate side of one of these was covered in the resin layer (A) by making into a substrate paper which makes natural pulp a principal component A resin layer (A) contains a polyethylene system resin, a polypropylene regin, a polyester system resin, or a polycarbonate system resin as a principal component. After activation of the resin layer (A) side is carried out, to this resin layer (A) side And ethylene structural-unit 80 - 98.5-mol %, Resin covering paper for printing characterized by preparing the application layer which consists of 0.5-10 mol % and cation nature acrylamide structural-unit 1of acrylate structural units -10mol %, and contains the copolymer emulsion of weight average molecular weight 1000-50000.
[Claim 2] Resin covering paper for printing according to claim 1 whose activation is corona discharge processing.
[Claim 3] Resin covering paper for printing characterized by the contact angle theta specified by the following of an application stratification plane being 60 degrees or more.
Waterdrop of 3.0micro of pure water 1 is made to **** to the application stratification plane of the sample horizontally held under the contact angle of theta:25 degrees C, and 65% environment of RH perpendicularly. The contact angle value 1 second after **** is specified as the contact angle theta of an application stratification plane (unit : degree).
[Claim 4] Resin covering paper for printing according to claim 1, 2, or 3 which is that in which a resin layer (A) contains a pigment.
[Claim 5] Resin covering paper for printing according to claim 4 whose pigment is a titanium-dioxide pigment or a calcium-carbonate pigment.
[Claim 6] The side covered with a resin layer (A) is resin covering paper for printing according to claim 1, 2, 3, 4, or 5 characterized by being that in which the paper substrate side of an opposite side is covered with a resin layer (B), and a resin layer (B) contains a polyethylene system resin, a polypropylene regin, a polyester system resin, or a polycarbonate system resin as a principal component.
[Claim 7] Resin covering paper for printing according to claim 6 which is that in which a resin layer (B) contains a pigment.
[Claim 8] Resin covering paper for printing according to claim 7 whose pigment is a titanium-dioxide pigment or a calcium-carbonate pigment.

[Translation done.]

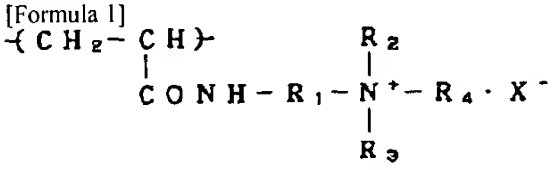
DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] this invention makes a substrate paper which makes natural pulp a principal component, about the resin covering paper for printing by which the paper substrate (it may be hereafter called base paper) side of one of these was covered in the resin layer, especially printing nature is good, and printed matter sells, and a sex is related with the good resin covering paper for printing.
[0002]
[Description of the Prior Art] the paper which makes natural pulp a principal component conventionally -- a substrate -- carrying out -- a base paper side -- film ****** -- the resin covering paper for the base material for photographs covered with a certain resin is known well JP,55-12584,B -- a base paper -- film ****** -- the technology about a certain resin and the base material for photographs preferably covered with polyolefin resin is indicated U.S. patent 3,501,298th The technology about the base material for photographs in which both sides of a base paper were covered with polyolefin resin is indicated by the number official report. Moreover, since the quick photograph development method of silver-halide sensitive material was applied, and the base material for photographs by which both sides of a base paper were covered with the polyethylene system resin is mainly put in practical use as an object for the photographic printing papers and has given sharpness if needed into the resin layer by the side of image formation of one of these, the titanium-dioxide pigment is usually contained. moreover -- The resin covering paper for photographs which covered the base paper with the polyolefin resin which adds to 15 - 20 % of the weight of titanium-dioxide pigments, and contains the oxide and/or 0.05 - 30 % of the weight of carbonates of alkaline earth metal is proposed by JP,57-116339,A.
[0003] However, the resin covering paper for these photograph uses was what has a problem extremely from the point of the handling nature of printed matter, and a printability, when it used for a printing use. In the first place, such resin covering papers for photographs tend to be charged, especially the printed matter after printing becomes easy to be charged, for the reason, printed matter sold it, the sex became bad, dealt with it, and it had the trouble that a sex was bad. It was what has much generating of the printing omission (it may only abbreviate to a printing omission hereafter) from which the printing section escapes white to it when resin covering paper prints to the second, and has a problem. It was imagined as what the opening according to dust and dust to an interface with a resin layer and ink layer when dust and dust become easy to adhere to a resin layer since resin covering paper tends to be charged as the reason, and printing resin covering paper arises, and ink so is not printed, but a printing omission produces widely centering on dust and dust.
[0004] Moreover, in JP,2-33399,A, it is 20 - 80 % of the weight of inorganic bulking agents. The resin covering paper for the printing use which covered the base paper with the polypropylene regin or polyethylene system resin to contain is proposed. however, the resin covering paper for printing using this technology printed by printing quality being very bad -- to the case, generating of the concentration unevenness of a printing omission and the printing section was very large, and it was a thing with a problem
[0005]
[Problem(s) to be Solved by the Invention] Therefore, the purpose of this invention is that there is no generating of the imprint omission of the printing section by which one field of the base paper which makes natural pulp a principal component was covered with the resin, and the handling nature of printed matter offers the good outstanding resin covering paper for printing. Other purposes of this invention will become whether to be Ming from the publication of the following specifications.
[0006]
[Means for Solving the Problem] In the resin covering paper for printing by which this invention persons made the substrate paper which makes natural pulp a principal component as a result of inquiring wholeheartedly that the above-mentioned technical problem should be solved, and the paper substrate side of one of these was covered in the resin layer (A) What contains a polyethylene system resin, a polypropylene regin, a polyester system resin, or a polycarbonate system resin as a principal component as a resin layer (A) is used. After carrying out activation of the resin layer (A) side, to this resin layer (A) side And ethylene structural-unit 80 - 98.5-mol %, It found out that the purpose of this invention was attained by consisting of 2-10 mol % of the 0.5-10 mol % and cation nature acrylamide structural units of acrylate structural units, and preparing the coverage containing the copolymer emulsion of weight average molecular weight 1000-50000.

[0007] The purpose of this invention found out being attained effectively by using corona discharge processing as activation. Moreover, by making into 60 degrees or more the contact angle theta specified by the following of the application layer containing the specific copolymer emulsion in this invention, the purpose of this invention finds out being attained notably and results in this invention.
[0008] The application stratification plane of the sample held at a level under 25 degrees C, and 65% environment of RH with the contact angle theta of the application stratification plane said on these specifications is made to **** perpendicularly waterdrop of 3.0micro of pure water l. It is the value (unit : degree) of the contact angle measured after [of ****] 1 second.
[0009] Specifically, it asks as the following. Measurement can be performed using the automatic contact angle meter CA-Z opportunity by consonance surface chemistry incorporated company. The hypodermic needle of 28 gages (outer-diameter 0.35mmphi) which carried out Teflon processing is attached in the point of a glass syringe. Pure water is attracted and poured in (air is not put in). moreover, the bottom of 20 degrees C, and 65% environment of RH -- a sample -- the level upper and lower sides -- a movable sample base -- setting -- after that -- a hypodermic needle -- previously -- the waterdrop of 3.0microl -- creating -- The after [1 second] sample base is raised by part for 12.0m/. . It is a sample base in the place which waterdrop ****(ed) to the application stratification plane of a sample 25mm/The picture 1 second after making it descend by the part and measuring from **** is incorporated with a camera, and the contact angle theta (unit : degree) is measured. In addition, when a change surveillance region like drawing 1 was set up and the white of this monochrome picture and 20% of black changed, as the computer recognized ****, it performed ****. Moreover, contact angle theta (degree) is called for from a-one number by measuring r (1/2 of the base of a drop) and h (height of a drop) of the drop of the picture incorporated like drawing 2 .
[0010]
[Equation 1]

$$\theta = 2\tan^{-1}(h/r)$$

[0011] As the specific copolymer (it may only abbreviate to EAA copolymer hereafter) emulsion which consists of the ethylene structural unit and acrylate structural unit which are used for operation of this invention, and a cation nature acrylamide structural unit If a 0.5-10-mol % and cation nature structural unit is [a 80-98.5 mol % and acrylate structural unit] 1-10-mol % for an ethylene structural unit and weight average molecular weight is the thing of the range of 1000-50000, various kinds of things can be used.
[0012] Although the ethylene structural unit in a copolymer carries out comparatively the EAA copolymer used for operation of this invention and it is 80-98.5-mol % of a thing The thing of the 85-97-mol range of % is desirable. When an ethylene structural unit is less than [80 mol %], adhesiveness appears in an application layer and it is a problem. If it increases more than 98.5-mol % on the other hand, the antistatic performance of an application layer will become bad, and it is a book.
[0013] Although the acrylate structural unit in a copolymer carries out comparatively the EAA copolymer used for operation of this invention and it is 0.5-10-mol % of a thing, its thing of the 1.5-7-mol range of % is desirable. When an acrylate structural unit is less than [0.5 mol %] The adhesive property of the resin layer of resin covering paper and an application layer becomes bad, or the adhesive property of an application layer and printing ink becomes weak, and it is a problem, on the other hand, when [than ten mol %] more, adhesiveness appears in an application layer and it is a problem, abrasion resistance becomes weak, and the maintenance nature of printing ink becomes bad and poses a problem. As an example of an acrylate structural unit, methyl acrylate, ethyl acrylate, eta-propylacrylate, isobutyl acrylate, etc. can be raised.
[0014] Although the cation nature acrylamide structural unit in a copolymer carries out comparatively the EAA copolymer used for operation of this invention and it is 1-10-mol % of a thing, its thing of the 2-8-mol range of % is desirable. When a cation nature acrylamide structural unit is less than [1 mol %], an antistatic performance becomes bad, the effect of this invention is not acquired, and when and resin covering paper is offset on the other hand than ten-mol %, riding of printing ink gets worse extremely and poses a big problem in respect of a printability.
[0015] What is shown by ** 1 can be raised as an example of the cation nature acrylamide structural unit in the EAA copolymer used for operation of this invention.
[0016]
[Formula 1]



[0017] R1 in ** 1 expresses the alkylene machine of carbon numbers 2-8. As an example of R1, an ethylene, a propylene machine, a hexamethylene machine, a neopentyl machine, etc. are raised, a field to the ethylene or propylene machine of the ease of manufacture and economical efficiency is desirable, and especially a propylene machine is desirable. Moreover, respectively, a low-grade alkyl group is expressed, a methyl group, an ethyl group, a propyl group, a butyl, etc. are raised as the example, and R2 and R3 in ** 1 have a point to desirable methyl group or ethyl group of antistatic nature. Moreover, R4 in ** 1 expresses an alkyl group, an arylated-alkyl machine, or an alicycle alkyl group. As an example of R4, alicycle alkyl groups, such as arylated-alkyl machines, such as alkyl groups, such as a methyl group, an ethyl group, n-propyl group,

i-propyl group, n-butyl, a sec-butyl, n-octyl machine, and n-lauryl machine, a benzine machine, and P-methyl benzyl, a cyclohexyl machine, and a methyl cyclohexyl machine, are raised, for example, the point of antistatic nature to a low-grade alkyl group is desirable, and especially a methyl group or an ethyl group is desirable. Furthermore, X in ** 1 expresses anion components, such as halogen atoms, such as Cl and Br, CH3OSO3, and C2H5OSO3.

[0018] The weight average molecular weight is the thing of the range of 1000-50000, and the EAA copolymer used for operation of this invention is the thing of the range of 3000-30000 preferably. The weight average molecular weight said here is the value measured by the gel permeation chromatography, and it can measure according to macromolecule collected works, the 44th volume, No. 2, and the method of a 139-141 pages (1987) publication. When weight average molecular weight is less than 1000, the coat organization potency of an application layer is bad, and abrasion resistance and the retentivity of printing ink are bad, and pose a problem. On the other hand, when weight average molecular weight exceeds 50000, manufacture of an emulsion becomes impossible easily, and coating liquid viscosity becomes high too much, and poses a problem. Moreover, as a manufacturing method of the EAA copolymer emulsion used for operation of this invention, the method of a publication can be raised, for example to JP,6-1921,A.

[0019] Although the resin covering paper for printing in this invention prepares the application layer containing a specific EAA copolymer emulsion, in order to make a printability, especially offset-printing fitness much more good, what prepared the application layer whose contact angle theta said on these specifications of an application stratification plane is 60 degrees or more is desirable. as the method of making the contact angle theta of the application layer containing a specific EAA copolymer 60 degrees or more -- concrete -- ** -- a suitable EAA copolymer emulsion is chosen ** Make a surfactant suitable in an application layer contain. ** It can adjust by making the polymer latex besides the suitable hydrophilic binder for an application layer, or this invention use together and contain etc.

[0020] As a coverage of the specific EAA copolymer emulsion in this invention, two or more 5 mg/m is desirable as a solid weight of a copolymer. . If there are too few coverages, an antistatic performance is insufficient, and it is a book.

[0021] Various kinds of additives can be made to contain in the application layer used for operation of this invention. The emulsion or latex which makes a component ethylene and an acrylic acid (or methacrylic acid) at least as an emulsion and latexes, A styrene-butadiene system, styrene-acrylic nature, vinyl acetate-acrylic, As the water-soluble polymer or the hydrophilic colloids of an ethylene-vinyl acetate system, butadiene-methyl methacrylate system copolymers, and those carboxy denaturation copolymers, such as an emulsion or a latex Starch system polymer, polyvinyl alcohol system polymer, gelatin system polymer, As an emulsion, a latex or water-soluble polymer, such as cellulose system polymer and polyacrylamide system polymer, or a hardening agent of a hydrophilic colloid As a pigment an activity halogenated compound, a vinyl sulfone compound, an aziridine compound, an epoxy compound, an acryloyl compound, an isocyanate compound, chromium alum, a chromium sulfate, etc. With the EAA copolymer emulsion in this invention, clay, a kaolin, a calcium carbonate, talc, a barium sulfate, a silica, titanium oxide, etc. as an antistatic agent of another kind Organic antistatic agents, such as a polystyrene sulfonate and a water-soluble cation nature copolymer, As inorganic antistatic agents, such as colloid metallic oxides, such as a colloid silica, a colloid alumina, and a synthetic hectorite clay colloid, a calcium chloride, a sodium nitrate, and a sodium chloride, and antiseptics To JP,1-102551,A, as a surfactant a publication or the para-hydroxybenzoic-acid ester compound of instantiation, a bends iso thiazolone compound, an iso thiazolone compound, etc. Anion system surfactants, such as an alkylbenzene sulfonate and a sulfo succinic-acid ester salt, Nonion system surfactants, such as a saponin and an alkylene oxide system, JP,47-9303,B, The surfactant which the publication fluoro-ized on the U.S. Pat. No. 3,589,906 specifications etc., You can make it contain combining suitably amphoteric surface active agents, such as a sulfo betaine type surfactant given in JP,1-166035,A, amino acid, and ester of an amino alcohol, a fluorescent brightener, a pH regulator, etc.

[0022] As equipment which applies the application layer coating liquid of this invention to the resin stratification plane of resin covering paper, an air knife coater, a roll coater, a bar coating machine, a blade coating machine, a slide hopper coating machine, a gravure coating machine, a flexo gravure coating machine, a curtain coating machine, extrusion coating machines, those combination, etc. are mentioned in operation of this invention. Moreover, it can choose out of various kinds of methods, such as a DIP method, a roll method, an extrusion method, and a fountain method, as an applicator in the case of dividing the application section and a metering zone.

[0023] As a dryer of the application layer coating liquid in this invention, it can choose from various dryers, such as a dryer using hot air drying equipments, such as a straight-line tunnel dryer, an arch dryer, an air loop dryer, and a sign KABUEA float dryer, infrared radiation, a heating dryer, microwave, etc. Although it changes with the coverage of coating liquid, manufacture speed, length of a dryer, etc. when using a hot air drying equipment, a hot blast temperature is 50-160 degrees C, and the drying time is 0.5 seconds - about 10 minutes. 2 - 60 seconds is preferably desirable. Moreover, if required, the hot blast for dryness can also be dehumidified.

[0024] It is desirable to perform the application of application layer coating liquid by the so-called on-machine method for applying and drying application layer coating liquid, by the time it rolls round, after covering a resin layer with every stage to the base paper side it runs although there is no inconvenience, if it is after a resin layer is prepared in a base paper side in this invention, and preparing an application layer. Moreover, after rolling round resin covering paper, it can also carry out after storing winding if needed by the so-called off-machine method for newly accumulating and preparing an application layer.

[0025] In this invention, it is desirable to give activation, such as corona discharge processing and a flame treatment, to a resin side in advance of an application on the occasion of the application of application layer coating liquid. When not giving

activation to a resin side, printing ink becomes easy to exfoliate from printed matter, the adhesive property of the so-called printing ink with resin covering paper becomes bad, and it is a problem. The adhesive property of printing ink is improved further and it is a book.

[0026] Although it is the paper which makes natural pulp a principal component as a base paper used for operation of this invention, you may use together synthetic pulps other than natural pulp, and a synthetic fiber if needed.

[0027] It is advantageous to use natural pulp which has been indicated or illustrated to JP,58-37642,A, JP,60-67940,A, JP,60-69649,A, JP,61-35442,A, etc. and which was chosen appropriately as pulp which constitutes the base paper used for operation of this invention. According to the bleaching processing and the alkali extraction or the usual alkali treatment, and usual need for chlorine, a hypochlorite, and chlorine-dioxide bleaching, the wood pulp of the needle-leaf tree pulp and the hardwood pulp which performed those combination processings, such as oxidation-bleaching processing by the hydrogen peroxide, oxygen, etc., and needle-leaf tree broad-leaved tree mixture pulp is used advantageously, and natural pulp can use various kinds of things, such as kraft pulp, a sulfite pulp, and soda pulp.

[0028] Various kinds of additives can be made to contain in the base paper used for operation of this invention at the time of pulp slurry manufacture. As a sizing compound, to a fatty-acid metal salt or a fatty acid, and JP,62-7534,B, the alkyl ketene dimer emulsification object or epoxidation higher-fatty-acid amide of a publication or instantiation, The alkenyl or an alkyl succinic-acid anhydride emulsification object, a rosin derivative, etc. as a dryness paper reinforcing agent As humid paper reinforcing agents, such as anionic, cation nature or an amphoteric polyacrylamide, polyvinyl alcohol, cation-ized starch, and vegetable galactomannan A polyamine polyamide epichlorohydrin resin etc. as a loading material clay, a kaolin, a calcium carbonate, titanium oxide, etc. as a fixing agent Water-soluble aluminum salts, such as an aluminum chloride and aluminium sulfate, etc. as a pH regulator Caustic alkali of sodium, sodium carbonate, sulfuric acid, etc. In addition, it is advantageous to make JP,63-204251,A, JP,1-266537,A, etc. contain combining suitably the color pigment of a publication or instantiation, a coloring color, a fluorescent brightener, etc.

[0029] Moreover, various kinds of water-soluble polymer, an antistatic agent, and an additive can be made to contain with size press or a tub-size press in the base paper used in favor of operation of this invention. As water-soluble polymer, to JP,1-266537,A, a publication or the starch system polymer of instantiation, Polyvinyl alcohol system polymer, gelatin system polymer, polyacrylamide system polymer, cellulose system polymer, etc. as an antistatic agent Alkali-metal salts, such as a sodium chloride and potassium chloride, a calcium chloride, Organic antistatic agents, such as colloid metallic oxides, such as alkaline-earth-metal salts, such as barium chloride, and a colloid silica, and a polystyrene sulfonate, etc. as an emulsion and latexes a petroleum-resin emulsion, an ethylene-vinyl acetate copolymer, and JP,55-4027,A As a pigment an emulsion or a latex of a copolymer etc. which makes a component the ethylene and the acrylic acid (or methacrylic acid) of a publication or instantiation at least at JP,1-180538,A As for clay, a kaolin, talc, a barium sulfate, titanium oxide, etc., it is advantageous as a pH regulator that you make it contain combining suitably additives, such as said color pigment, other coloring colors, fluorescent brighteners, etc., such as a hydrochloric acid, a phosphoric acid, a citric acid, and caustic alkali of sodium.

[0030] Although there is especially no limit about the thickness of the base paper used for operation of this invention, the basis weight has the desirable thing of 20 - 200 g/m2.

[0031] Moreover, what the thickness unevenness index Rpy of the direction of paper making specified below set to 350mV or less as a base paper used for operation of this invention is desirable, the thing 270mV or less carried out is still more desirable, and a thing 200mV or less is the most desirable. It is made to run a sample between two spherical sensing pins in the thickness unevenness index Rpy said here. The film thickness measuring instrument which measures thickness change of a sample as an electrical signal through an electronic comparator is used. the sensitivity range of an electronic comparator on condition that **15micrometer/**3V It is 1.5m fixed speed for /to the direction of paper making of an after [a zero point adjustment] sample. Thickness change of the direction of paper making of a sample is measured by scanning. The fast Fourier transform of the acquired measurement-signal value is carried out to a time window using the Hanning window using an FFT analyzer. It is the value (unit : mV) which is asked for the power spectrum (unit : mV 2) by averaging of 128 addition, and is asked for the value which totaled the power value of a 2Hz - 25Hz frequency region, and hung two thirds 1 / by carrying out a square.

[0032] Specifically, with a staple fiber, by smooth nature's, beating is carried out 30% of the weight or more, so that the amount of continuous glass fiber may decrease if possible by the beater 50% of the weight or more, using a cone hardwood pulp preferably as a way preferably used for operation of this invention the thickness unevenness index Rpy manufactures stencil paper 350mV or less. For example, as for beating of pulp, it is desirable to make it the weighted average fiber of the pulp after beating set to 0.4-0.75mm. Subsequently, about the pulp slurry which added inner ******, the suitable paper-making method which has been indicated or illustrated to JP,58-37642,A, JP,61-260240,A, JP,61-284762,A, etc. is adopted, paper can be milled so that uniform formation may be obtained by paper machines usually used, such as a Fortlinear paper machine and a cylinder machine, and calender processing can be further performed using an after [paper milling] machine calender, a supercalender, a heat calender, etc., and the thickness unevenness index Rpy can manufacture a base paper 350mV or less.

[0033] One field of the base paper of the resin covering paper for printing in this invention is covered with a resin layer (A). As a resin layer (A), although a polyethylene system resin, a polypropylene regin, a polyester system resin, polycarbonate system resins, or those mixture are included as a principal component, what makes a principal component especially a polyethylene system resin, polypropylene regins, or those mixture from the point of melting knockout coating nature and a

.film plasticity is desirable.

[0034] As a polyethylene system resin preferably used for operation of this invention A low-density-polyethylene resin, a medium-density-polyethylene resin, a high-density-polyethylene resin, A straight chain-like low-density-polyethylene resin and ethylene are made into a principal component. A propylene, A copolymer with alpha olefins, such as a butylene, and ethylene are made into a principal component. An acrylic acid, They are copolymers and such mixture, such as a methacrylic acid, an acrylic-acid methyl ester, and a methacrylic-acid methyl ester. Although the thing of various kinds of densities, a melt flow rate (the melt flow rate specified by JIS K 6760 is only hereafter abbreviated to MI), molecular weight, and molecular weight distribution can be used usually, density 0.90 - 0.97 g/cm3, and 10 0.1-50g of MI(s) and minutes -- desirable -- 0.3-35g of MI(s), and 10 minutes Two or more sorts can use independently the thing of the range of molecular weight 20,000-250,000, mixing.

[0035] As a polypropylene regin preferably used for operation of this invention They are the copolymerized random polypropylene regins and such mixture. a polypropylene regin, a random polypropylene regin, and a propylene -- a principal component -- carrying out -- an ethylene component -- 1-10-mol % -- Although the thing of various kinds of densities, a melt flow rate (the melt flow rate specified by JIS K 6758 is only hereafter abbreviated to MFR), molecular weight, and molecular weight distribution can be used usually, density 0.88 - 0.92 g/cm3, and MFR10-60g/-- two or more sorts can use independently the thing of the range for 15-45g of MFRs, and 10 minutes preferably for 10 minutes, mixing Moreover, the compound resin which makes a polyethylene system resin and a polypropylene regin a principal component can be used in order to improve the knockout coating nature of a polypropylene regin.

[0036] As a polyester system resin used for operation of this invention, a polyethylene-terephthalate resin, polybutyrene terephthalate resin, polyester system biodegradability resins, etc. are such mixture, and can use the thing of various kinds of densities and intrinsic viscosity [eta]. as the concrete example of representation -- polyester resin (tradename: -- the nova tex HS004, density 1.33 g/cm3, and [intrinsic-viscosity eta] 0.7 dl/g) by Mitsubishi Kasei Corp. It can raise. Moreover, although the thing of various kinds of grade can be used as a polycarbonate system resin used for operation of this invention, as a concrete example of representation, the polycarbonate resin (tradename : NOVAREX 7022A, a hypoviscosity type) by Mitsubishi Kasei Corp. can be raised.

[0037] When using together two or more sorts of different grade or kinds of resin used for operation of this invention, as for those resins, in combined use of the two or more sorts of polyethylene system resins or the polypropylene regin from which density and a melt flow rate specifically differ, combined use of a polyethylene system resin and a polypropylene regin, combined use of a polyethylene system resin and a polyethylene-terephthalate system resin, etc., it is desirable to use as a resin constituent which consists of the prepared compound resin which carried out melting and mixture beforehand. The resin of two or more sorts of different grade or a kind can be beforehand used for simple melting alligation, multi-stage melting alligation, etc. as melting and a method of mixing and preparing a compound resin. For example, using an extruder, a 2 shaft extruder, a heating roller milling machine, a Banbury mixer, a pressurized kneader, etc., various kinds of additives, such as an antioxidant and lubricant, are added further if needed, and melting and after mixing, the resin which the specified quantity uses together, and the method of pelletizing the mixture are used advantageously. When it adds directly in the state with simple mixture to a melting extruder and melting knockout coating is carried out without using the resin used together as a compound resin, a problem occurs in many cases in respect of the adhesive property of a base paper and a resin layer, the miscibility between resins, fabricating-operation nature, etc.

[0038] The resin layer (A) (resin layer which front resin layer and front resin layer side is covered by side front, and is covered [layer / (A) / following and resin] by background and background in the opposite side may be abbreviated to back resin layer) side of the resin covering paper for printing in this invention can process a mirror plane or a glossy surface, a fine split face given in JP,62-19732,B, a mat side, or ******.

[0039] although the resin covering paper for printing in this invention is covered with a resin layer (A), in order that the base paper side of an opposite side may give water resistance, printing nature, etc. with the side covered with a resin layer (A) -- film ****** -- what was covered with the resin layer (B) which contains a certain resin as a principal component is desirable those film ****** -- as a certain resin, thermoplastics, such as a polyolefine system resin, a polycarbonate system resin, a polyester system resin, and a polyamide system resin, is desirable, and what makes a principal component the polyethylene system resin described above from **** synthetic especially, polypropylene regins, and those mixture is desirable Moreover, you may cover with the electron ray hardening resin of a publication or instantiation to JP,60-17104,B.

[0040] As covering thickness of the front resin layer of the resin covering paper for printing in this invention, although the range of 4-100 micrometers is useful, as described above, the 10-micrometer or more range of 50 micrometers or less is desirable. Although it is desirable to be covered with the resin layer (B) which contains a certain resin as a principal component, the resin has the same desirable thing as the thing of a side front. moreover, the base paper side of the opposite side -- film ****** -- with the resin of a side front as the covering thickness Although the range of 4-100 micrometers is useful preferably [setting up suitably in the range which maintains especially curl balance], and generally, it is the range of 6-50 micrometers preferably.

[0041] The resin covering paper for printing in this invention can be manufactured by covering a resin layer uniformly. It is desirable to cover with the so-called melting knockout coating method which uses a melting extruder for a resin constituent on the base paper it runs, casts in the shape of a film from the slit die, and is covered as a method of covering a resin layer uniformly to a base paper side. Specifically, temperature controls, such as ** barrel and a die, are performed and the

·continuous resin regurgitation is made to be performed from die opening. ** As temperature of a melting film, it is desirable to make it 270 degrees C - 335 degrees C, and it is still more desirable to make it 280 degrees C - 320 degrees C. ** As a slit die, the flat die of T type die, an L type die, and a fishtail type die is desirable, and especially T type die is desirable. As a diameter of slit opening, it is to make it 0.1mm - 2mm. Especially auto FUREKKUSUDAI is desirable.

[0042] Before coating a base paper with a resin constituent on the occasion of manufacture of the resin covering paper for printing in this invention, it is desirable to give activation, such as corona discharge processing and a flame treatment, to a base paper. Moreover, you may cover a resin layer like a publication at JP,61-42254,B to the base paper it runs after spraying ozone content gas on the melting resin constituent of the side which touches a base paper. Moreover, when also covering a background with a resin layer, serially, as for a table and a hidden resin layer, it is desirable to be covered with the so-called tandem knockout coating method by which knockout coating is carried out by the base paper, and it may cover them with the multilayer knockout coating method which makes a table or a hidden resin layer the multilayer composition more than a bilayer if needed continuously preferably. Moreover, the back resin stratification plane of the resin covering paper for printing may process a glossy surface, a fine split face given in JP,62-19732,B, a mat side, or ******.

[0043] the inside of the table of the resin covering paper for printing in this invention, and a hidden resin layer -- the sharp feeling of a printing picture or improvement of sharp nature, grant of pencil retouch nature, improvement of the receptiveness of printing ink, etc. sake -- white pigments -- it is preferably desirable a titanium-dioxide pigment or a calcium-carbonate pigment, and to make them use together and contain still more preferably As those examples, it is as a titanium-dioxide pigment. It is the titanium-dioxide pigment of a publication or instantiation to JP,60-3430,B, JP,63-11655,B, JP,1-38291,B, JP,1-38292,B, JP,1-105245,A, JP,57-116339,A, etc. As a calcium-carbonate pigment, the calcium-carbonate pigment of a publication or instantiation can be raised to JP,57-116339,A, JP,2-33399,A, etc. Moreover, a zinc oxide, talc, a kaolin, etc. can be raised as other white pigments.

[0044] Various kinds of additives can be made to contain besides white pigments in the table of the resin covering paper for printing in this invention, and a hidden resin layer. In order to improve the dispersibility to the resin of white pigments, the detachability at the time of resin covering paper manufacture, etc. A zinc stearate, a calcium stearate, an aluminum stearate, A magnesium stearate, palmitic-acid zinc, myristic-acid zinc, Fatty-acid amides, such as fatty-acid metal salts, such as palmitic-acid calcium, octadecanamide, and an arachidic-acid amide, To JP,1-105245,A, a publication or the hindered phenol of instantiation, Various antioxidants, such as hindered amine, the Lynn system, and a sulfur system, cobalt blue, The pigments and colors of a blue system, such as ultramarine blue, SERIAN blue, and a copper phthalocyanine blue, The pigment of Magenta systems, such as cobalt violet, fast violet, and manganese violet, a color, and JP,2-254440,A can be made to contain combining suitably various kinds of additives, such as a fluorescent brightener of a publication or instantiation, and an ultraviolet ray absorbent. As for white pigments and various kinds of additives, it is desirable that you make it contain as the masterbatch or compound of a resin. The masterbatch which was added to the resin at high concentration in addition to the time of manufacture of the compound resin described [be / under / resin / adding / beforehand / it] above as the table especially used for operation of this invention and a method of making these additives contain in the resin constituent for back resin layers may be created beforehand, and this masterbatch may be added to a dilution resin at the time of melting knockout covering.

[0045]

[Example] Hereafter, although an example explains this invention in detail, the content of this invention is not restricted to an example.

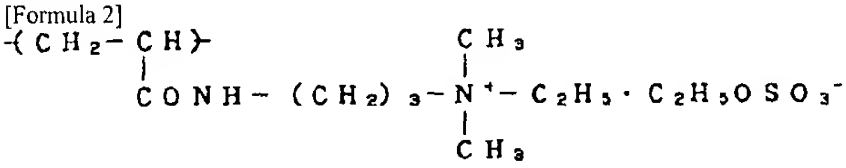
[0046] Examples 1-7 And it is the fiber length (it is based on the JAPAN TAPPI paper pulp test method No and 52-89 "paper and a pulp fiber length test method") of the pulp after beating about the mixed pulp which consists of the example 1 of comparison - 70 % of the weight of 2 broad-leaved-tree bleaching kraft pulp, and 30 % of the weight of broad-leaved tree bleaching sulfite pulps. the measured length weighted average fiber length -- displaying -- it is set to 0.62mm -- as -- after beating As opposed to the pulp 100 weight section The cation-ized starch 3 weight section, the anion-ized polyacrylamide 0.2 weight section, The alkyl ketene dimer emulsification object (considering as part for ketene dimer **) 0.4 weight section, polyamide epichlorohydrin resin 0.4 weight section and fluorescent brightener [a suitable quantity of], blue color, and red color was added, and the pulp slurry was prepared. Then, a web is formed, putting on the Fortlinear paper machine which is running the pulp slurry by part for 200m/, and giving the suitable turbulence. It is 30 - 70 kg/cm at the dryness part who processes with a smoothing roll and continues after performing the wet press which is three steps where the linear pressure was adjusted in the 15-100kg [/cm] range by the wet part. It dried, after performing the bulk density press which is two steps where the linear pressure was adjusted in the range. In the middle of dryness, then, the carboxy denaturation polyvinyl alcohol 4 weight section, The 25 g/m2 size press of the size press liquid which consists of the fluorescent brightener 0.05 weight section, the blue color 0.002 weight section, the sodium chloride 4 weight section, and the water 92 weight section is carried out. The base paper whose thickness unevenness index Rpy which dries so that the base paper moisture finally obtained may become 8% of the weight with bone-dry moisture, carries out [the index] machine calender processing by linear pressure 70 kg/cm, and is said on these specifications of basis-weight 170 g/m2 of the resin covering paper for printing is 170mV was manufactured.

[0047] Next, after carrying out corona discharge processing of the rear face of a base paper, melting knockout coating of the compound resin constituent which consists of the low-density-polyethylene resin (density 0.926 g/cm3, 10 MFR=2g /, minutes) 35 weight section and the high-density-polyethylene resin (density 0.967 g/cm3, 10 MFR=20g /, minutes) 65 weight

'section was carried out by part for travel-speed/of 200m of a base paper at 320 degree C of ****** at the thickness of 26 micrometers.
[0048] then, the this front face after carrying out corona discharge processing of the front face of a base paper -- a low-density-polyethylene resin (density 0.922 g/cm3 --) MI=6.0g / 20 % of the weight, and an ethylene component cool 80 % of the weight (density 0.900g/cm3, 10 MFR=28g /, minutes) of random seven-mol polypropylene regins which are % after a kneading knockout for 10 minutes using a 2 shaft kneading extruder. The compound resin constituent (density 0.904 g/cm3, 10 MFR=21g /, minutes) 89.5 weight section and the water aluminum oxide which were pelletized and manufactured (as opposed to an opposite titanium dioxide) as aluminum2O 3 minutes -- 0.75 % of the weight the titanium-dioxide pigment 10 weight section and the zinc-stearate 0.5 weight section which carried out surface treatment -- a Banbury mixer -- kneading -- Melting knockout coating of the compound resin constituent containing a titanium-dioxide pigment pelletized [was cooled and] and manufactured was carried out by part for travel-speed/of 200m of a base paper at the resin temperature of 320 degrees C at the thickness of 25 micrometers. As a cooling roller, it operated at 12 degrees C of circulating water temperatures using the thing of the mirror plane to which chrome plating was given at that time. Moreover, melting knockout coating of a table and a hidden resin constituent was performed by the so-called tandem system to which knockout coating is performed serially.
[0049] Furthermore, the on-machine application of the application liquid given in Table 1 was carried out in a combination given in the table of resin covering paper, or a hidden resin stratification plane in Table 1, and the resin covering paper for printing was obtained.
[0050] Then, the offset-printing testing machine performed the printing examination to the side containing the pigment of resin covering paper, and the method of a publication estimated below.
[0051] as the evaluation method of the printing omission of the printing section of resin covering paper -- as printing ink -- Toyo Ink, Inc. make -- solid printing was carried out so that cyano concentration might be set to 0.85 in the blue ink of TSP-300, and viewing judged and estimated the grade of the printing omission of the printing section
[0052] As an error criterion of the printing omission of the printing section, it is as follows.
O there is completely a :printing omission -- it is -- there is almost nothing
**: It is usable although a printing omission is accepted for a while.
x: A printing omission is accepted and there is a problem practically.
[0053] printed matter -- selling -- as the sexual evaluation method -- the bottom of the environmental condition of the temperature of 25 degrees C, and 25% of relative humidity -- as printing ink -- the Toyo Ink make -- in each ink of the yellow of TSP-400, a Magenta, cyanogen, and black, 500 pictures were printed, it dealt with them, and the sex was judged and evaluated
[0054] Printed matter sells and it is as follows as a sexual error criterion.
O : sell and a sex is good.
**: It is usable although selling has resistance a little.
x: Several sheets adhere together and there is a problem practically.
[0055] Moreover, it is computed in the formula based on JIS K 6911, and, specifically, surface resistivity (unit : omega) given in Table 1 is YOKOGAWA ELECTRIC and a 4329A type insulation-resistance tester by Hewlett Packard Co. (HIGH RESISTANCE METER) A 16008A type electrode (RESITIVITY CELL) is used. In charging-time 30 seconds, it applied correspondingly, and it computed to the operation manual by having measured, and it was asked.
[0056] The cellophane adhesive tape (tradename Scotch tape) by Nichiban Co., Ltd. was stuck on the picture of the printed matter which was sold and was printed as the adhesive evaluation method of printing ink with a resin layer for sexual evaluation, it exfoliated at a stretch, and the ablation grade of printing ink was judged and evaluated.
[0057] As an adhesive error criterion of printing ink, it is as follows.
O : printing ink does not exfoliate at all but the adhesive property of printing ink is very good.
**: It is usable although printing ink exfoliates only.
x: Printing ink becomes or it exfoliates on the whole surface, and the adhesive property of printing ink is bad and there is a problem practically.
[0058] The obtained result is shown in Table 1.
[0059]
[Table 1]

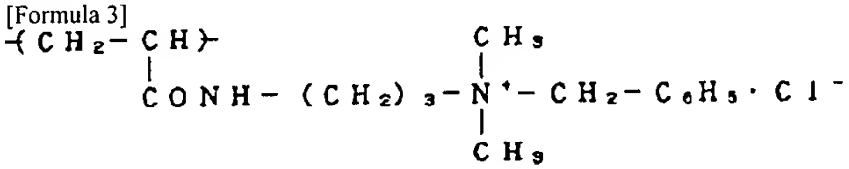
	表樹脂層へのコロナ放電処理の有、無	表樹脂層へ塗設した塗布層の配合	裏樹脂層へのコロナ放電処理の有、無	裏樹脂層へ塗設した塗布層の配合	印刷抜けの発生の程度	表樹脂層へ塗設した塗布面の表面抵抗率(Ω)	さばき性	印刷インキの接着性
比較例1	無し	無し	無し	無し	×	1×10^{15}以上	×	×
比較例2	有り	無し	有り	配合(D)	×	1×10^{15}以上	×	△
実施例1	無し	配合(A)	有り	配合(D)	○	2×10^{11}	△~○	×~△
実施例2	有り	配合(A)	有り	配合(D)	○	2×10^{11}	△~○	△
実施例3	有り	配合(B)	有り	配合(D)	○	1.0×10^{9}	○	○
実施例4	有り	配合(B)	有り	配合(B)	○	1.0×10^{9}	○	○
実施例5	有り	配合(C)	有り	配合(D)	○	1.0×10^{9}	○	○
実施例6	有り	配合(B)	無し	無し	○	1.0×10^{9}	△~○	○
実施例7	有り	配合(C)	有り	配合(C)	○	1.0×10^{9}	○	○

[0060] In addition, combination [in Table 1] (A) - (D) is as follows.
[0061] Combination (A): The application layer which consists of four mol % of structural units shown by 93 mol three mol % and ** 2 of % and ethyl acrylate structural units of ethylene structural units, makes a principal component the copolymer emulsion (it only abbreviates to an emulsion (E) hereafter) of weight average molecular weight 20,000 [about], and contains the application assistant of optimum dose (contact angle of 79 degrees of the application stratification plane specified on dryness coverage 0.1 g/m2 and these specifications).
[0062]
[Formula 2]



[0063] Combination (B): The application layer which makes a principal component the constituent which consists of (Emulsion E):colloid silica (tradename [by Nissan chemistry incorporated company] snow tex C) =1:1 as a part for dry weight, and contains the application assistant of optimum dose (contact angle of 82 degrees of the application layer specified on dryness coverage 0.1 g/m2 and these specifications).
[0064] Combination (C): Let the constituent which consists of (Emulsion E):composition hectorite clay-colloid (tradename by British rapport industrial incorporated company] RAPONAITOS) =1:1 be a principal component as a part for dry weight. Application layer containing the application assistant of optimum dose (contact angle of 78 degrees of the application layer specified on dryness coverage 0.1 g/m2 and these specifications).
[0065] Combination (D): Make into a principal component the constituent which consists of the above-mentioned colloid silica:styrene acrylic-ester copolymer system latex =1:3 as a part for dry weight, and it is polystyrene sulfonic-acid soda 0.021g/m2 further. Application layer containing the application assistant of other optimum dose (dryness coverage 0.4 g/m2).
[0066] The resin covering paper for printing in this invention which prepared the application layer containing a specific EAA copolymer emulsion (examples 1-7) does not have generating of a printing omission, and it sells and it turns out well with good sex and adhesive property of printing ink that is excelled so that clearly from Table 1. It turns out that it is desirable to carry out corona discharge processing of the resin layer before preparing an application layer from the adhesive point of printing ink especially, and it is desirable a printing omission and to sell and to use together an EAA copolymer emulsion and a colloid inorganic antistatic agent in an application layer from the point of the sexual improvement effect.
[0067] On the other hand, it turns out that the thing besides this invention (examples 1-2 of comparison) has much generating of a printing omission, and it deals with it, a sex is bad and there is a problem.
[0068] It carried out like the example 3 except using a following water-soluble copolymer or a following copolymer emulsion instead of the EAA copolymer emulsion used in examples 8-10 and the three to example of comparison 7 example 3.
[0069] Copolymer emulsion (F): The same thing as a copolymer emulsion (E).

Copolymer emulsion (G): Consist of four mol % of structural units shown by 93 mol %, ethyl acrylate 3 mol %, and ** 3 of ethylene structural units. Copolymer emulsion of weight-average-molecular-weight abbreviation 16,000.
[0070]
[Formula 3]



[0071] Copolymer emulsion (H): Consist of nine mol % of structural units shown by 88 mol %, ethyl acrylate 3 mol %, and ** 2 of ethylene structural units. Copolymer emulsion of weight-average-molecular-weight 18,000.
Copolymer emulsion (I): Consist of nine mol % of structural units shown by 91 mol % and ** 2 of ethylene structural units, and it is the copolymer emulsion of weight average molecular weight 4000.
Copolymer emulsion (J): Consist of 30 mol % of structural units shown by 65 mol five mol % and ** 2 of % and propylacrylate structural units of ethylene structural units, and it is the copolymer emulsion of weight-average-molecular-weight abbreviation 14,000.
Copolymer emulsion (K): Consist of 13 mol % of structural units shown by five-mol % and ** 3 of ethylene structural-unit 82 mol % butyl acrylate structural units, and it is the copolymer emulsion of weight average molecular weight 10,000 [about].
Water-soluble polymer (L): The antistatic agent by Mitsubishi Petrochemical Co., Ltd., tradename SAFUTOMA ST-3000.
Copolymer emulsion (M): Styrene acrylic copolymer emulsion (the Mitsui Toatsu Chemicals, Inc. make, tradename Bon Ron S-224).
[0072] The obtained result is shown in Table 2.
[0073]
[Table 2]

	塗布層中の水溶性共重合体または共重合体エマルジョンの種類	印刷抜けの発生の程度	さばき性	印刷インキの接着性	塗布層の接触角(°)(注1)	給水着肉性(注2)
実施例8	(F)	○	○	○	82	○
実施例9	(G)	○	○	○	80	○
実施例10	(H)	○	○	△	65	△
比較例3	(I)	○	○	×	65	△
比較例4	(J)	○	○	×	50	×
比較例5	(K)	○	○	×	59	×
比較例6	(L)	○	○	×	45	×
比較例7	(M)	△	×	○	85	○

[0074] In addition, - (notes 1) in Table 2 (notes 2) is as follows.
[0075] (Notes 1) Express the contact angle (degree) of the application layer measured by the method indicated by this civilization thin document.
[0076] (Notes 2) As the evaluation method of water supply impression nature After making the water of a test piece adhere using the printability tester (RI-1 type) by Ming (AKIRA) factory incorporated company, it printed with the aforementioned printing ink and the impression grade was judged visually. As an error criterion of water supply impression nature, it is as follows.
O : water supply impression nature is good and offset-printing fitness is good.
**: It is usable although water supply impression nature is a little inadequate.
x: Water supply impression nature is bad and a problem is in offset-printing fitness practically.
[0077] The resin covering paper for printing in this invention (examples 8-10) does not have generating of a printing omission, and it sells, and a sex and the adhesive property of printing ink are good, and it turns out with still better offset-printing fitness that is excelled so that clearly from Table 2. Especially as a contact angle of the point of water supply impression nature to an application layer, although 60 degrees or more are desirable, it turns out that especially a larger contact angle than 65 degrees is desirable. On the other hand, it turns out that the thing besides this invention (examples 3-7 of comparison) has the trouble, respectively.
[0078] instead of [of the resin constituent used in the example 11 example 3] -- 68.5 % of the weight (tradename : nova tex

HS004) of polyester resin by Mitsubishi Kasei Corp. the titanium-dioxide pigment masterbatch 33.4 weight section and the above-mentioned polyester resin 66.6 weight section which consist of 30 % of the weight (the E. I. du Pont de Nemours& Co. make, tradename R-101) of rutile-titanium-dioxide pigments, and 1.5 % of the weight of zinc stearates -- a 2 shaft kneading extruder -- using -- after a kneading knockout Except covering the compound resin constituent containing the titanium-dioxide pigment pelletized [was cooled and] and manufactured, like the example 3, there was no generating of a printing omission, and it sold and the outstanding polyester system resin covering paper for printing with a good sex was obtained.

[0079] it carries out like an example 3 except using the compound resin constituent which uses together and contains a following titanium-dioxide pigment and a following calcium-carbonate pigment instead of the compound resin constituent containing the titanium-dioxide pigment used in the example 12 example 3, and there is no generating of a printing omission, and the adhesive property of printing ink is good -- in addition -- and offset-printing fitness and the resin covering paper for printing in which sold and especially the sex was excellent were obtained

[0080] 47.5 % of the weight (density 0.924 g/cm3, 10 MI=8.5g /, minutes) of low-density-polyethylene resins, the masterbatch 10 weight section of the 50 % of the weight of the aforementioned anatase type titanium-dioxide pigments, and the titanium-dioxide pigment which consists of 2.5 % of the weight of zinc stearates 47.5 % of the weight (density 0.924 g/cm3, 10 MI=8.5g /, minutes) of low-density-polyethylene resins, The compound resin constituent which consists of the masterbatch 20 weight section of a calcium-carbonate pigment and the gay type polypropylene regin (density 0.905 g/cm3, 10 MFR=42g /, minutes) 70 weight section which consist of 50 % of the weight of whiting, and 2.5 % of the weight of zinc stearates.

[0081]

[The result of invention] and there is no generating of the imprint omission of the resin covering paper for printing which was excellent in the quality and handling nature of printed matter which make paper a substrate with this invention, especially printed matter, offset-printing fitness is good and the adhesive property of printing ink is good -- in addition -- and printed matter sells and a sex can offer the good outstanding resin covering paper for printing

---

[Translation done.]